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backwards and forwards, between two stops, a definite amount, but the amount the wheel is turned is varied by an adjustable sector, which engages a pin fixed to the pawl and prevents the pawl from engaging the milling on the wheel. By adjusting the position of this sector the feed can be varied from nothing to about $\frac{5}{32}$ of a turn, and hence since the screw has twenty-five threads to the inch, the thickness of the sections cut can be varied from a minimum, depending on the perfection with which the razor is sharpened, to a maximum of $\frac{5}{32}$ of $\frac{1}{25}$ of $\frac{1}{6\frac{1}{4}}$ or $\frac{1}{1000}$ of a turn. The practical minimum thickness obtainable with a good razor is approximately $\frac{1}{40000}$ of an inch. The value of the teeth on the milled wheel are as follows:

1 tooth of the milled wheel $= \frac{1}{40000}$ of an inch $= .000625^{\text{mm}}$
2 teeth " " " $= \frac{1}{20000}$ " " $= .001250^{\text{mm}}$
4 " " " " $= \frac{1}{10000}$ " " $= .0025^{\text{mm}}$
16 " " " " $= \frac{1}{2500}$ " " $= .01^{\text{mm}}$

The movement of the lever which carries the embedded object is effected by a string attached to the end of the lever. This string passes under a pulley and is fastened to the arm carrying the pawl. Attached to the other end of the lever is a spring pulling downwards.

When the arm is moved forwards the feed takes place, the string is pulled, the embedded object is raised past the razor, and the string is stretched. When the arm is allowed to move back the spring draws the imbedded object across the edge of the razor, and the section is cut. The string is attached to the lever by a screw which allows the position of the embedded object to be adjusted so that, at the end of the forward stroke, it is only just past the edge of the razor. This is an important adjustment, as it causes the razor to commence the cut when the object is traveling slowly, and produces the most favorable conditions for the sections to adhere to each other.

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SCIENTIFIC NEWS.

— To the report of the Commissioner of Fisheries of New York in charge of the oyster investigation is appended Dr. H. J. Rice's excellent tract on the propagation and natural history of the American oyster. An account is first given of experiments carried on at Cold Spring harbor on the propagation of the oyster, and then follows notes on the distribution of the animal, the structure of its shell, the gross anatomy of the animal including the reproductive organs, succeeded by chapters on seed oysters, the food of the oyster, its coloration, its artificial propagation, the methods of obtaining spat, and the friends and enemies of the oyster. Reference is made to the supposed method of extraction of the animal of the oyster by the star-fish; as the result of his own observations Dr. Rice was not able to decide as to the exact method or methods; he, however, inclines to the opinion that the star-fish works in more than one way, sometimes suffocating, sometimes poisoning and sometimes taking in the oyster bodily. Due credit is given to the labors of Dr. Brooks and Mr. Ryder. The report is illustrated by six plates, which add materially to our knowledge of the structure of the shell, the soft parts and the rate and mode of growth of the shell.

— An apiculture station has recently been established at Aurora, Ills., in connection with the Entomological division of the Department of Agriculture. Mr. Nelson W. McLain has been appointed to take charge of the station, and Professor Riley has instructed him to pay particular attention to the following subjects:

1st. To secure the introduction and domestication of such races of bees as are reported to possess desirable traits and characteristics; to test the claims of such races of bees as to excellence, and to prove by experiments their value to the apiculturists of the United States and their adaptation to our climate and honey-producing flora.

2d. To make experiments in the crossing and mingling of races already introduced, and such as may hereafter be imported, and by proper application of the laws of breeding endeavor to secure the type or types best adapted by habit and constitution to the uses of practical bee-keepers in the United States.

3d. To make experiments in the methods of artificial fertilization, and if possible demonstrate the best process by which the same may be accomplished.

4th. To test the various methods of preparing bees for winter —such as stimulating late breeding, removing the pollen from the hive in winter, feeding on sugar syrup, watering during long confinement, the stimulating of early breeding in spring, the control of the swarming impulse and the prevention of swarming.

5th. To gather statistics concerning the bee-keeping industry in the United States, and obtain an approximate estimate of the number of colonies of bees kept, the number of pounds of honey and wax produced in the several States and in the United States, and the value of the same.

6th. To make experiments with and observations concerning varieties of honey-producing plants for bee-forage.

7th. To study the true cause or causes of diseases yet imperfectly understood, and the best methods of preventing or curing such diseases.

8th. To obtain incontestible results by intelligent experiments, upon scientific methods, as to the capacity of bees, under exceptional circumstances, to injure fruit, *i. e.*, to set at rest the ever-discussed question of bees *vs.* fruit.

— We have received from the author, M. A. Vayssière, memoire No. 3 of the second volume, zoölogy, of the Annales du Musée d'Histoire Naturelle de Marseille, entitled Recherches zoologiques et anatomiques sur les Mollusques opisthobranches du Golfe de Marseilles, 5, première partie, Tectibranches. This work fills 181 quarto pages, with six well-drawn plates, and is a product of the zoölogical laboratory founded by Professor Marion at Marseilles.

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PROCEEDINGS OF SCIENTIFIC SOCIETIES.

American Association for the Advancement of Science.—This body met at Ann Arbor, Mich., Wednesday August 26th, and terminated its sessions Tuesday September 1st, 1885, under the presidency of Professor H. A. Newton of New Haven. The officers of the meeting were as follows: Of Section E, vice president, Edw. Orton of Columbus, O.; secretary, H. Carvill Lewis of Philadelphia. Of Section F, Burt G. Wilder of Ithaca; secretary, J. A. Lintner of Albany. In the absence of Professor Wilder Professor T. J. Burrill of Champaign, Ill., took the chair. Of Section H, Wm. H. Dall of Washington, D. C.; secretary, Mrs. Erminnie A. Smith of Jersey City. In the absence of Mr. Dall, Mr. J. Owen Dorsey, of Washington, became chairman of the section. Section G was united with Section F. Its chairman was Mr. S. H. Gage of Ithaca; secretary W. H. Walmsley of Philadelphia.

The following papers were read:

Thursday, August 27th. *Section E—Geology.*—The geology of Ann Arbor, Alexander Winchell; Westward extension of rocks of the Lower Helderberg period in New York, S. G. Williams; Lower Silurian fossils in a limestone of Emmons' original Taconic, James D. Dana; Structure and relations of the Dakota Group, L. E. Hicks; Results from a study of the Gabbros and associated Amphibolites in Delaware, Frederick D. Chester; On the occurrence of trap rock in eastern Kentucky, A. R. Crandall; The quaternary deposits of Illinois, A. H. Worthen; Post-glacial changes of level in the basin of Lake Ontario, G. K. Gilbert; Sources of trend and *crustal surplusage* in mountain-structure, Alexander Winchell; A probable cause of the shrinkage of the earth's crust, William B. Taylor.

Section F—Biology.—An observation on the hybridization and cross-fertilization of plants, E. Lewis Sturtevant; germination studies, E. Lewis Sturtevant; Biological deductions from a comparative study of the influence of cocaine and atropine on the organs of circulation, Dr. H. G. Berger; On the brain and auditory organs of a Permian Theromorph Saurian, Edw. D. Cope; Observations on the musk-rat, Amos. W. Butler; The question